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RECENT CONFERENCES ON FERTILIZERS

- USSR -

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Discussion of Results of Geographical Grid Tests by the All-Union Scientific Research Institute of Fertilizers and Soil Science (VIUA).

N. Mikhaylov

From June 23rd to June 27th of this year a conference was held in the All-Union Scientific Research Institute of Fertilizers and Soil Science (VIUA); the conference, which was attended by employees of scientific research institutes, was called by the section on fertilizers and soil science of the VASKhNIL /All-Union Academy of Agricultural Sciences imeni Lenin/ and by the Institute.

Participating in the conference were representatives from 37 branch, republic, and zone scientific research institutions, 30 agricultural experimental stations, scientific research and planning institutes of chemical industry and agricultural specialists.

At the conference there was a discussion of the results of geographical grid tests with fertilizers during 1958 and a program was laid out for scientific research for 1960.

The following reports were heard and discussed: Corresponding Member of the VASKhNIL I.I. Sinyagin "The Tasks of Agrochemistry in the Decisions of the 21st Congress of the Communist Party of the Soviet Union"; VASKhNIL Academician P.A. Baranov "Conditions for Application and Effectiveness of New Forms of Mineral Fertilizers"; Professor P.G. Naydin "Major Problems in the Technique of Introducing Fertilizers and Fertilizer Systems in Crop Rotation"; Candidate of Agricultural Sciences I.P. Mamchenkov " On Methods

of Preparing and Using Dung-Earth and Other Composts"; Candidate of Biologist Sciences L.M. Dorosinskiy "Primary Questions in the Study of Bacterial Fertilizers in Geographical Grid Tests"; Candidate of Agricultural Sciences I.V. Mosolov "Some Problems of the Physiology of Mineral Nutrition of Plants in connection with the Use of Fertilizers". Candidate of Agricultural Sciences A.P. Kevorkov reported to the conference on the effectiveness of trace fertilizers (boron, manganese, copper, molybdenum, cobalt, and zinc) and on projected work in their further study. Candidate of Agricultural Sciences L.S. Lyubarskaya gave a report on a program for collective work in scientific research institutes on increasing the accuracy of methods used for determining the phosphorus compounds in soil which are available to plants.

Much attention was given to questions concerned with working out the best method for introducing mineral fertilizers in communities that are fundamentally agricultural.

The following Candidates of Agricultural Sciences reported on these questions at the conference: N.N. Mikhaylov (VIUA); Ye.A. Brovkina (All-Union Scientific Research Institute of Sugar Beets); A.L. Vyshinskiy (Ukrainian Scientific Research Institute of Agriculture); I.K. Artyukhov (All-Union Scientific Research Institute of Corn); P.V. Protasov (All-Union Order of Lenin Scientific Research Institute of Cotton); I.N. Chumachenko (Tadzhik Scientific Research Institute of Agriculture); N.D. Kornev (Kirgiz Scientific Research Institute of Agriculture); N.I. Semergey (Turkmen Scientific Research Institute of Agriculture); V.S. Rubanov (Belorussian Scientific Research Institute of Agriculture); M.M. Petrova (All-Union Scientific Research Institute of Flax) and Doctor of Agricultural Sciences N.F. Kornilov (Northwest Scientific Research Institute of Agriculture.)

It was noted in the reports and discussions that the use of mineral fertilizers in moderate amounts results in an assured increase in yield and a higher economic profit from the fertilizers. By economic use of mineral fertilizers in regions where they are applied extensively in industrial crops it is possible in the current seven-year period to increase significantly the area devoted to grain crops and thereby obtain up to two billion additional poods of grain per year.

International Conference of Specialists on the Production and Use of Fertilizers

I.I. Sinyagin

From July 7 to July 12 of this year in Sofia, the capital of the Bulgarian People's Republic, a conference of specialists was held on the production and use of fertilizers in countries that are members of the Council of Mutual Economic Aid.

Participating in the conference were representatives of the People's Republic of Albania, People's Republic of Bulgaria, Hungarian People's Republic, German Democratic Republic, Polish People's Republic, Rumanian People's Republic, the USSR, and the Czechoslovak Republic. Representatives of the Chinese People's Republic and the Korean People's Democratic Republic were present as observers.

The following questions were discussed:

1. The most effective quantities of mineral fertilizers which can be introduced per hectar of agricultural area in the various countries which are members of the Council of Mutual Econonic Aid.

2. The volume of scientific experimentation on the production and use of compound fertilizers.

3. The volume of scientific experimentation on the production and use of liquid fertilizers.

In addition a discussion was held at the conference on the course of fulfillment of decisions made in 1957 on scientific cooperation in production of mineral fertilizers.

A summary report on the first question, based on materials presented by delegates of all the member countries of the Council for Mutual Economic Aid, was given by the delegation from the German Democratic Republic.

The report reflected the remarkable gains in agricultural development attained during the past few years in all the socialist countries.

In their long-term plans all of the member countries of the Council for Mutual Economic Aid anticipate further significant increase in productivity and gross production of grain, fodder, and the produce from industrial, vegetable, and fruit-and-berry crops. In order to carry out these plans it is essential to increase substantially the delivery of mineral fertilizers to agriculture and improve the ratios in its various forms. These ratios understandably vary in different countries depending upon their soil and climatic conditions, type of farming and peculiarities of agricultural engineering.

For example, in the USSR, where there is much black earth that is relatively rich in nitrogen and in the grain producing areas a high density of regions with inadequate moisture, phosphates predominate in the N:P:K ratio throughout the country. In the German Democrat Republic and Czecho-

slovakia potassium is foremost among these nutrient substances. In Albania, Bulgaria and Rumania nitrogen is foremost.

In the initial years of the seven-year plan it is planned to introduce the following corrections in the average N:P:K ratio.

	Ratio of N:P:K	
	in 1958	in 1965
Albania	1:0.68:0.45	1:0.8:0.8
Bulgaria	1:0.34:0.04	1:0.95:038
Hungary	1:0.68:0.46	1:0.79:0.50
German Democratic Republic	1:0.9:2.2	1:1:1.8
Poland	1:0.8:1.2	1:0.8:0.9
Rumania	1:1.2:0.13	1:0.5:0.2
USSR	1:1.55:1.07	1:1.44:1.07
Czechoslovakia	1:1.1:1.8	1:1:1.4

On the topic of volume of experimentation in the production and use of compound (complex) fertilizers the conference heard reports by N.N. Polyakov (USSR) "Scientific Research and Experimental Work on the Production of Compound Fertilizers by Nitric Acid Treatment of Phosphorities"; Professor F.V. Turchin (USSR) "Effectiveness of Compound Fertilizers Obtained by Nitric Acid Treatment of Phosphates " B. Ball (Hungary) "Subsequent Results of Investigations on the Production of Nitrophos in Hungary"; V. Mazgay (Poland) "Agricultural Experiments on the use of fertilizers mixed with pesticides."

The conference noted that the use of complex mineral fertilizers obtained by decomposition of phosphates by nitric acid is very economical. The advantage of these fertilizers is mainly that they free agriculture of the labor-consuming work of preparing mixtures from simple fertilizers. Compound fertilizers can be made in granular form which considerably facilitates their storage and mechanical application.

Of the various forms of compound fertilizers obtained by different methods of treating phosphates with nitric acid, the most sought-after are concentrated fertilizers with high P_2O_5 content in water-soluble form. Such fertilizers may be obtained by a method that involves the separation of excess calcium as nitrate by freezing or a method that calls for addition of phosphoric acid. In the production of compound fertilizers the ratio of $N:P_2O_5$ in the prepared product may be regulated according to the needs of the consumer.

By using a scheme with sulfuric acid or sulfates, fertilizers can be obtained containing the cecessary ingredients in water-soluble form and satisfying the agricultural needs for proper nitrogen and phosphoric acid ratios; however the product obtained by this scheme is less concentrated.

Results of agrochemical investigations (Professor F.V. Turchin and others) showed that the phosphor of granular nitrophos carbonate, containing its entire amount of P_2O_5 in citrate soluble form, is used either little or not at all by plants. However in the powdered form this nitrophos does not function less effectively, if introduced before sowing, than a mixture of superphosphate, ammonium nitrate and potassium chloride which is equivalent to it in nutrient materials. This peculiarity of behavior of nitrophos should be kept in mind when setting up its manufacture. It is desirable to work out processing techniques which assure the release of part of the nitrogen in the process so that a fertilizer will be obtained with a more equal ratio (close to unity) of nitrogen and phosphoric acid.

Some results of research and production work on the technology of compound fertilizers were reported at the conference. Questions were brought up that are still unsolved or inadequately worked out, providing topics for further investigations in this important branch of chemical industry.

Reports on liquid nitrogenous fertilizers were given by Academician P.A. Baranov (USSR) "Use of Liquid Fertilizers in the USSR"; I.A. Makarov (USSR) "Experience in the Application, Storage and Transportation of Liquid Nitrogenous Fertilizers in the Irkutskaya Oblast"; I. Fizler (German Democratic Republic) "Experiments in Fertilizing with Liquid Ammonia and Ammoniated Fertilizers"; R. Baterl (Czechoslovakia) "Liquid Fertilizers in Czechoslovakia"; I. Drymb (Rumania) "The Use of Liquid Nitrogen in the Rumanian People's Republic".

The conference noted that production and use of liquid nitrogenous fertilizers is a progressive measure which has an important economic effect. During recent years the use of liquid nitrogenous fertilizers has spread rather rapidly

in the USSR and Czechoslovakia; they are also used in Poland. Within the next few years their use in the countries named should increase substantially. They are also receiving wide distribution in Bulgaria.

The conference worked out an extensive program for further investigations on improvements in the manufacture and use of liquid nitrogenous fertilizers.

Participants in the conference unanimously attached great importance to the volume of scientific gains and manufacturing experience needed for further technical progress in the mineral fertilizer industry and widespread use of mineral fertilizers in the socialist countries. A desire was stated to have the next conference in 1960.

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